

Groundwater Management Issues in Texas

- 2 The rule of capture and groundwater policy
- 3 Groundwater districts
- 4 Groundwater marketing
- 6 Proposed alternatives for groundwater regulation
- 11 Recent developments

Water policy is an issue that has received consistent attention from the Texas Legislature in recent years. By 2050, the state's population is expected to reach 40 million, a two-fold increase over the 2000 population. Over the same period, water supplies from existing groundwater sources are expected to decrease 19 percent, from 8.8 million acre-feet per year in 2000 to 7.2 million acre-feet in 2050. Projections such as these have led policymakers to reexamine the manner in which groundwater is regulated and utilized in hopes of preserving Texas' groundwater resources in the most efficient manner.

The focus on water issues during the last decade resulted in the enactment of two bills that established a new process by which the state would plan and manage its limited water resources for the future – SB 1 by Brown in 1997 and SB 2 by Brown in 2001. These bills established a managed and planned approach to ensure that the water needs of all Texans will be met, even during conditions of drought. The product of SB 1's planning process, a [statewide water plan](#) created by 16 regional water planning authorities, was released in 2002 and identified a need for many parts of the state to reduce demand for water or acquire additional water resources in order to meet future needs. Specifically, the plan dictates that by 2050, water consumption from all sources can increase only 15 percent over the current annual level of 16.9 million acre-feet to approximately 20 million acre-feet.

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Texas Water Code, sec. 35.002(5) defines groundwater as water percolating below – that is, filtering through – the surface of the earth. While aquifers, or underwater lakes, are classified as groundwater, underwater streams and the underflow of surface streams are considered surface water. Groundwater is an important source for many water users in the state, particularly in West and Central Texas. Approximately 36 percent of water used for municipal purposes comes from aquifers, and agricultural irrigation accounted for approximately 80 percent of water produced from aquifers in 1999. Bexar County (San Antonio) is the largest urban area to rely primarily on groundwater as its water source.

Groundwater figures prominently in the planning strategies of several of SB 1's regional water planning areas. In fact, the Texas Water Development Board (TWDB) estimates that one-half of the volume of water available for use in the state is groundwater. Given its importance, regulation of groundwater resources has been one of the most challenging aspects of the state's approach to water policy.

Most controversy surrounding groundwater in the state can be traced back to a unique doctrine known as the "rule of capture," which specifies that groundwater in Texas is a privately owned resource. In contrast to surface water, which is owned publicly by the state, groundwater is controlled by the owner of the land that overlies the water, theoretically allowing the owner to pump an unlimited amount of groundwater. This doctrine has persisted despite controversy since the rule was established by a 1904 Texas Supreme Court decision that was reaffirmed as recently as 1999. While the Legislature has not modified or replaced the rule of capture, it has used other methods to manage policy issues related to groundwater. Specifically, SB 1 and SB 2 addressed the issue of groundwater management through the promotion of local groundwater conservation districts that regulate the pumping of groundwater through decentralized, district-level rules and procedures.

Ultimately, reconciling the rule of capture with the groundwater management and planning process initiated with the enactment of SB 1 has proven difficult. Critics of water policy based on the rule of capture argue that recent developments in technology, combined with increasing demands on limited water resources, render the rule obsolete. Supporters of water policy based on the rule of capture say that it protects the property rights of landowners while allowing the Legislature to manage groundwater by creating local conservation districts.

As the statewide water planning process continues, additional changes to groundwater regulation may be considered. Debate over groundwater regulation is particularly likely given recent events in certain parts of the state that have focused attention on the numerous controversies, challenges, and perceived shortcomings of the current state groundwater regulation. In light of these challenges, this report examines the history of groundwater law in Texas, issues that the state's groundwater management system faces today, and proposals to address those issues.

The rule of capture and groundwater policy in Texas

According to the TWDB's 2002 *Water for Texas* report, groundwater is the source of half of the water available for use in the state. For this reason, groundwater figures prominently in the planning strategies of several of the regional water planning areas. As Texas has increased its reliance on groundwater over past decades, a fundamental tenet of groundwater law in the state – the rule of capture – has remained remarkably static. Based on English Common Law, the rule of capture allows a landowner to pump as much groundwater as the landowner chooses, without liability to neighbors whose wells might be depleted by the pumping. The rule of capture was adopted by the Texas Supreme Court to settle a dispute in the 1904 case *Houston and T.C. Ry. Co. v. East*, 81 S.W. 279 (Tex. 1904). The court cited two reasons in adopting the rule. First, in what has become an emblematic phrase for those who contend that the rule is outdated, the court found that the "secret, occult, and concealed" nature of groundwater and its movement made effective regulation impossible. Second, the court determined that any attempt to apportion groundwater would discourage both established and future water-development projects.

Although the rule of capture remains law in Texas, certain legislative acts and judicial rulings have modified it in significant ways. The first of these changes occurred in 1917 when, following a period of drought, voters approved the addition of the Conservation Amendment (Art. 16, sec. 59) to the Texas Constitution. The amendment established that conservation of water and other natural resources are duties of the state and that the Legislature shall enact laws for this purpose.

Based on the Conservation Amendment, the Texas Supreme Court has repeatedly affirmed the Legislature's power to regulate groundwater use, even while retaining the rule of capture. Some exceptions to the rule have emerged in judicial opinions since the court originally adopted the rule. The only exception in the *East* decision was that water be put to beneficial use and not wasted. However, in 1955 the Supreme Court ruled in *City of Corpus Christi v. City of Pleasanton*, 276 S.W.2d 798 (Tex 1955) that a landowner could not maliciously remove groundwater to injure a neighbor. Further, following the enactment of legislation in 1975 that addressed the problem of subsidence in the

Houston-Galveston area (see *Effects of groundwater use*, page 9), the court ruled in *Friendswood Development Co. v. Smith-Southwest Industries, Inc.*, 576 S.W.2d 21 (Tex. 1978) that a well owner can be held responsible for negligently causing subsidence of surrounding land.

Friendswood has proved to be the last major modification to the rule of capture, although the rule subsequently has been challenged unsuccessfully in court. In 1999, in *Sipriano v. Great Springs Water of America, et. al.*, 1 S.W.3d 75 (Tex. 1999), a plaintiff claimed that nearby pumping by Great Springs – a.k.a Ozarka Natural Spring Water Co. – had dried up his well. The plaintiff asked the court to impose liability on landowners who “unreasonably” use groundwater to their neighbors’ detriment. The court, however, ruled in favor of the defendant, unanimously affirming the rule of capture. Citing the Conservation Amendment, the court stated that “Texas voters made groundwater regulation a duty of the Legislature,” compelling the court to rely on the Legislature to regulate groundwater.

In its affirmation of the rule of capture in the *Sipriano* decision, the court cited the 75th Legislature’s enactment in 1997 of SB 1, which streamlined the process for creating groundwater districts and gave districts more authority to establish requirements for groundwater withdrawal permits. The court found that given the Legislature’s initiation of regulatory reform under SB 1, it would not be appropriate for the court “to insert itself into the regulatory mix” by replacing the rule of capture with some other regulatory scheme (see *Alternate forms of groundwater regulation*, page 6). The court found it appropriate to wait and see if the reforms in SB 1 would lead to more prudent water management.

However, many commentators have interpreted the *Sipriano* decision as indicating that the court may alter the rule of capture at some later date if the Legislature does not address perceived shortcomings in the current system. In his concurring opinion, Justice Nathan Hecht stated: “It would be inappropriate to disrupt the processes created and encouraged by the 1997 legislation before they have had a chance to work. I concur in the view that, for now – but I think only for now – *East* should not be overruled.”

Groundwater districts

Concern over unsustainable water demands has existed ever since the rule of capture was adopted. To address these concerns, the Legislature has enacted measures to limit groundwater use. In 1949, the Legislature first exercised its constitutional authority under the Conservation Amendment by creating a petition process for designating groundwater management areas and authorizing the creation of conservation districts to conserve and protect groundwater resources.

Groundwater districts have been an important part of water planning for decades, and they have become even more vital in recent years. The enactment of SB 1 in 1997 established the centrality of groundwater districts in statewide water management by specifying conservation districts as the preferred method for managing groundwater resources. Since 1997, dozens of new groundwater districts have been established to perform this important function, leading to a vast expansion in the area of the state in which groundwater resources are governed by local districts. In 2000, approximately 9 million of the 10 million acre-feet of total groundwater usage in the state came from groundwater districts, leaving 10 percent of the produced groundwater in the state outside any district jurisdiction.

Of the state’s 254 counties, a total of 138 either are fully or partially within a groundwater district. Of the 89 groundwater districts currently in Texas, 84 have been confirmed by voters in local elections, while five have yet to be confirmed. Each district, which can have an area the size of one or two counties, enables local district officials to establish regulations and parameters governing the manner in which landowners use their groundwater resources.

The regulations adopted by local groundwater conservation districts vary across the state and often reflect local decisions based on regional preferences, geologic limitations, and the needs of citizens. Despite this variation, the regulations are uniformly relevant to the management of groundwater in the state given the fact that groundwater otherwise would be subject to the rule of capture. Only within groundwater districts do limitations on the rule of capture exist. These limits generally are manifested through

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traditional permitting, production limits, and well-spacing requirements or by a special statutory permitting system, such as that of the Edwards Aquifer Authority in Central Texas.

A groundwater district has the authority to regulate the spacing of water wells and to limit production from water wells. Groundwater districts can be created either by the Legislature or through the Texas Commission on Environmental Quality (TCEQ) through a local petition process by landowners within the proposed district. The districts created by the Legislature, known as special-law districts, typically follow the framework laid out in Water Code, ch. 36, while those created by TCEQ must follow the ch. 36 framework. Each piece of legislation creating a special-law district may differ, often lending different powers to different special-law districts.

A newly created groundwater district is required to develop and submit to TWDB a 10-year groundwater management plan detailing its management and conservation goals and procedures. Generally, groundwater districts are governed by elected boards that comprise between five and 11 directors who serve staggered four-year terms. Districts generally are financed by user fees for district maintenance and operation and issue and sell bonds for capital improvements, but some may assess local property taxes as well. Under Water Code, ch. 36, a district is subject to a confirmation election to approve the creation of the district and the election of the board. Voters within the district must approve the levy of taxes and the issuance and sale of bonds secured by those taxes.

Groundwater marketing

As with most water issues in Texas, different regulations govern transfers and exports of surface water and groundwater from one region of the state to another. Inter-basin surface water transfers are subject to various restrictions designed to protect the water rights and other interests of residents of the basin from which the transferred water originates. These state regulations include the “junior water rights” provision of the Water Code, under which any water right transferred out of a basin loses its seniority and becomes junior to other rights in the basin. This means that during a water shortage, out-of-basin uses are the first to be restricted.

The relatively high level of state regulation governing surface water transfers contrasts with state policy regarding the export of groundwater. Under current law, the rule of capture serves as a primary factor enabling the state, municipalities, and private companies to pursue projects designed to ship groundwater around the state. If water is subject to the rule of capture, then once a landowner captures the groundwater, the landowner effectively owns the water and may dispose of it at will. Currently, this includes the right to export that water outside of the local area.

Groundwater districts have the authority to place restrictions such as pumping limits, and export restrictions are generally understood to limit the ability of landowners to sell groundwater pumped from their land to out-of-district users. Although SB 2 significantly narrowed the ability of districts to limit exports, many districts still place some limitation on groundwater exports. For land both within and outside the boundaries of a groundwater district, however, there currently is no prescribed limitation in Texas law prohibiting the shipment of groundwater throughout the state.

Two recent proposals by private companies – Rio Nuevo Ltd. in far West Texas and Mesa Water Inc. in the Panhandle – have focused attention on the prospect of groundwater marketing and shipment from certain rural parts of the state to fast-growing metropolitan areas.

Mesa Water, Inc. The proposal of Mesa Water, Inc. was one of the first groundwater marketing plans to receive substantial public attention and media coverage. Mesa Water was formed in 1999 by investors, including oil and gas magnate T. Boone Pickens, to purchase the right to withdraw water from the Ogallala Aquifer in the Texas Panhandle. The Ogallala is the largest aquifer in the nation and extends beneath 174,000 acres in eight Western and Midwestern states.

Mesa Water has purchased from landowners the right to pump water from land under Roberts County and neighboring counties just north of Pampa. The company has proposed constructing a pipeline to supply water to river basins that could transfer the water to municipal customers such as Dallas, Fort Worth, or San Antonio.

The Mesa project has proven controversial with residents of the Panhandle and many state lawmakers, but proponents of the project argue that safeguards already exist to ensure responsible use of the aquifer. Supporters point out that the counties included in the company's holding are within the boundaries of the Panhandle Groundwater Conservation District (PGCD), one of the oldest and largest districts in the state, and that this district should be allowed to manage water in that area. Any withdrawals from the land in question would be subject to PGCD regulations limiting the amount of groundwater withdrawals such that 50 percent of the water currently in the aquifer must remain in place in 2048. Also, according to supporters, groundwater in the area currently is underutilized and could be put to productive use by rapidly growing urban areas that face imminent water shortages. Given the amount of capital investment required to meet the water infrastructure needs of Texas' growing population, public-private partnerships such as Mesa increasingly will be needed. Further, in response to concerns about the aquifer's sustainability, supporters argue that rainfall in the region will help recharge the aquifer.

Critics of the Mesa Water project fear that the large withdrawals proposed under the plan could harm agricultural and residential interests throughout West Texas that rely on water from the Ogallala. They point out that, unlike many aquifers in the state, the Ogallala is extremely slow to recharge, and the massive withdrawals proposed under the Mesa project could dry up the wells of cities, farmers, and ranchers in the region. Some also object to a plan that they feel pits the interests of large Texas cities against a rural region that relies upon groundwater for irrigation and residential use.

Mesa Water, Inc. holds preliminary permits from PGCD to pump water from approximately 90,000 acres, with additional permits pending. However, the project remains in the planning stage given the current lack of a willing municipal buyer for the Panhandle water as well as the expense required to construct a pipeline to deliver the water, costs for which could reach \$1.5 million per mile for what is predicted to be at least a 300-mile-long pipeline.

Rio Nuevo, LLC. The proposal of Rio Nuevo, LLC, also involves the marketing and export of groundwater, but with one important difference – the land from which the groundwater would be pumped is owned by the state.

In 2002, Rio Nuevo, a private company based in Midland, approached the General Land Office (GLO) with a proposal to lease land under the agency's jurisdiction and market groundwater beneath that land. Under the plan, Rio Nuevo would use 355,000 acres of public land in Hudspeth, Jeff Davis, Culberson, and Presidio counties in Far West Texas. Water pumped from those lands would be shipped by pipeline to currently unidentified municipal users.

The GLO has studied the Rio Nuevo proposal, and Land Commissioner Jerry Patterson has decided to pursue it. In reaching this decision, the office pointed to its constitutional charge to generate money from land under its control for the benefit of the Permanent School Fund (PSF), which contributes funding to the state's public school system. Historically, PSF lands have generated money from leases to oil and gas producers and to cattle ranchers. Rio Nuevo estimates that the lease pursued by Rio Nuevo could generate \$7 million per year to the PSF.

Supporters of pursuing water development deals on state land argue that projects such as the Rio Nuevo proposal could bring additional revenue into an \$18 billion endowment that pays more than \$700 million per year toward education of Texas schoolchildren. This prospect should not be ignored, particularly as the Legislature continues to search for innovative solutions to the state's school finance challenges. Lease of water rights could generate substantial revenue from isolated, rugged land that is of little productive value to the state and generates only limited revenue for the PSF. To best serve the state's financial interests, the GLO entered into direct negotiations with Rio Nuevo shortly after it approached the agency. This unique set of circumstances justifiably prevented the agency from opening the proposal to public bidding, say project supporters.

Opponents of the Rio Nuevo proposal express concern over the consequences that large scale withdrawals from aquifers in West Texas could have for the environment and the communities in the arid region. Agriculture is an important part of the region's economy, and critics worry that the project could drain groundwater reserves that currently provide irrigation to area farms. They question the wisdom of state participation in a proposal that would take water from one part of the state and redistribute it to urban areas, particularly since private interests participating in the proposal could have little incentive to consider the well-being of residents who live near the source of the water.

Some members of the public also expressed concern regarding the process by which the GLO initiated the Rio Nuevo project. They argued that the agency should have held public hearings prior to entering into any agreement with an outside groundwater marketing firm and that the proposed lease of state land should have been opened to a public bidding process. Others also questioned whether the amount of money raised by the lease is an amount sufficient to outweigh other concerns.

Proposed alternatives for groundwater regulation

Emerging issues such as the Mesa Water and Rio Nuevo groundwater marketing proposals have raised public awareness of groundwater policy in Texas. These issues and others led the 79th Legislature to reconsider groundwater policy during the 2005 regular session, although no law was enacted.

Alternate forms of groundwater regulation

Groundwater regulation varies considerably across the nation. In the western United States, where scarce rainfall and limited surface water make groundwater resources crucial, the rule of capture predominated until the 1950s. As aquifer depletion became an issue and better scientific information about aquifer movement emerged, most Western states developed new methods for regulating groundwater. Today, Texas is the only Western state that still applies the rule of capture to groundwater disputes.

One reason why Texas relies on the rule of capture for groundwater management is based in a longstanding legal assumption that surface and groundwater operate independently. This notion is belied by scientific discoveries proving that surface water and groundwater in fact are hydrologically linked. For example, seepage from a stream may recharge an aquifer, while aquifer-fed springs may feed a stream.

Several Western states administer or place certain limits on groundwater sources affected by or affecting surface water as part of the surface water appropriation system. In Texas, there has been increased study of the connection between sources of surface water and groundwater and a slight shift toward addressing ground and surface water interconnectedness in state resource management practices. For example, SB 1 requires groundwater districts to coordinate their management plans with surface-water management entities in the area. Some also have proposed limiting groundwater withdrawals when those withdrawals threaten negative environmental or economic consequences through reduced downstream flows.

In general, however, groundwater regulation in Texas differs substantially from the practices in most other states, particularly those in the arid West. Other than the rule of capture, there are four major legal doctrines governing conflicts between landowners with competing groundwater wells. In some cases, groundwater districts have modeled local regulations on various aspects of the different regulatory approaches outlined below.

Reasonable use. This doctrine provides a judicial remedy to landowners if the unreasonable use of groundwater by others harms their own reasonable use. Use on land other than land that overlies the aquifer from which a resource originates traditionally is defined as unreasonable.

Supporters of reasonable use point out that the on-location limitation inherent in the reasonable use doctrine inevitably would prevent excessive use of water. Opponents argue that there has proven to be little difference in practice between the doctrines of reasonable use and the rule of capture, beyond the provision under reasonable use that groundwater must be used on the land over the water's originating location. That is, under reasonable use regulations, a landowner may use as much water on his or her land as he or she wants, provided only that the water is not wasted. There is no proportional sharing of resources based on lot size and no preference for prior users. If, for example, a landowner used an immense amount of water to create a catfish farm or other project, thereby harming other uses, other users would have little recourse under the reasonable use doctrine.

Senate committee reports. Responding to increased public concern regarding groundwater and other water issues in the state, Lt. Gov. David Dewhurst in November 2003 created the Senate Select Committee on Water Policy. The lieutenant governor charged the committee with studying and providing recommendations on several aspects of state water policy, including the regulation of groundwater. At the same time, he created the Senate Subcommittee on the Lease of State Water Rights specifically to examine the issues raised by the Rio Nuevo

and other proposals to lease state land for groundwater exporting by private companies.

The Senate Select Committee on Water Policy released its [report](#) in December of 2004. Rather than providing specific recommendations for the reform of groundwater policy in the state, the committee chose to outline various challenges regarding water policy that the state currently faces and present certain policy alternatives available for addressing these concerns.

as long as the owner used the water on his or her own property.

Prior appropriation. Numerous Western states operate under the doctrine of prior appropriation. This rule is similar to the permit-based system regulating surface water in Texas, under which the user who obtains first access to a water resource has the most senior right to that resource. Like surface water, permitting for groundwater in states that use prior appropriation generally is subject to requirements that the water be put to some specified beneficial use. Strict adherence to prior appropriation of groundwater can be impractical because any pumping by junior water-rights holders inevitably will affect pumping by senior-rights holders. Consequently, states impose various definitions of reasonableness of use to limit pumping by permit holders.

Opponents of prior appropriation argue that adoption of such a doctrine in Texas would require extensive modification of groundwater regulation by local districts. Additionally, many contend that prior appropriation is unlikely to yield thorough and efficient use of the state's groundwater resources and that other methods sharing of water resources could prove more equitable than the "first in time, first in right" standard of prior appropriation.

Correlative rights. In 1903, California developed a doctrine of correlative rights that prorates use of groundwater among overlying landowners. When conflicts or shortages occur, each landowner is entitled to a share of water in proportion to the size of his or her land, and ratable deductions are made when all reasonable

needs cannot be met. Off-tract uses are allowed under correlative rights, but those uses are subordinate to on-tract uses of water, meaning that in times of scarcity, water transfers would be the first uses eliminated. For this reason, proponents of water rights marketing often oppose adoption of the correlative rights doctrine.

The Restatement of Torts rule. A judicial doctrine for groundwater was laid out by the American Law Institute, a body of lawyers, judges, and professors who strive to state the best aspects of American state laws. According to this rule, contained in Sec. 858 of the institute's Second Restatement of Torts, a well owner is liable for the withdrawal of groundwater only if the withdrawal:

- causes well interference by lowering the water table or reducing water pressure;
- results in pumping more than the well owner's reasonable share; or
- interferes with levels of streams and lakes that depend on groundwater.

Some commentators have argued that while the restatement rule protects against overpumping, it does not favor on-land use explicitly to encourage recharge of the underlying aquifer. Unlike correlative rights, allocation of groundwater under the restatement rule is not dictated by proportions of land ownership and can take into account uses that are more beneficial than others. Most states with a reasonable-use approach rely on some of the considerations discussed in the restatement.

Recognizing that the rule of capture is a major concern, the committee laid out alternatives for policymakers considering whether and how to change the rule. One option would be for the Legislature explicitly to retain the rule of capture and reaffirm groundwater districts as the preferred method of regulation in the state. This recommendation would address concerns that the Supreme Court might revisit its own decision in the *Sipriano* case without legislative attention to questions surrounding groundwater regulation. For this reason, those supporting this policy option argue that the Legislature should enact legislation to codify the status quo.

Another option presented by the Senate select committee calls for modification of the rule of capture to make an individual well owner liable for large scale groundwater withdrawals that interfere with a neighbor's well use. The Legislature also could require groundwater districts to adopt the goal of "aquifer sustainability" and prohibit aquifer mining except in certain slowly recharging aquifers such as the Ogallala.

Finally, the committee raised the option of abandoning the rule of capture outright and replacing it with another doctrine, such as the doctrine of correlative rights (see *Alternate forms of groundwater regulation*, page 6).

Beyond questions about the rule of capture, the Senate select committee also identified several challenges currently facing groundwater districts in the state and outlined a range of alternatives that could address them. The committee singled out certain shortcomings with the current system of groundwater management, including:

- the prevalence of conflicting strategies and goals of small, single-county districts that regulate a single groundwater resource;
- potentially insufficient state review of groundwater district management plans;
- the use of non-uniform terminology and methodology for evaluating the amounts of groundwater in groundwater districts' jurisdictions;
- excessive litigation against groundwater districts by landowners within district boundaries; and
- the potential for large-scale pumping just outside a district's boundaries that might undermine the district's management activities.

To address these problems, the committee outlined a range of options available to lawmakers. In order to coordinate management of groundwater along hydro-geologic boundaries rather than county boundaries, districts could be required to function as region-wide management districts. Adjoining districts could be required to merge and aquifer-wide districts established to supervise and coordinate the planning of smaller local districts.

In order to address problems stemming from districts' research and administrative limitations, the capacity of TWDB could be increased to provide technical assistance to districts. Further, to ease districts' legal burden, TCEQ could be authorized to hear challenges to groundwater district rules. TCEQ decisions could be appealed to state district court, with the attorney general representing the state. The state also could strengthen its review of groundwater district management plans and define in statute a standard lexicon of terms and measurement methodologies used by districts in the state.

A final option laid out in the select committee report would be the creation of a statewide groundwater district to be administered by TWDB or some other state agency with jurisdiction over all land not governed by a local groundwater district. A statewide district could render the rule of capture obsolete if the state subjected land in its jurisdiction to an alternate form of regulation. Any area not currently in a district could escape state regulation by opting into an existing district or by forming a new district.

In November 2004, the Senate Natural Resources Subcommittee on the Lease of State Water Rights released specific recommendations on the questions raised by the Rio Nuevo and other proposals for groundwater development on state lands. Among the specific findings laid out in the [report](#), the subcommittee recommended that any leases or grants of PSF land exceeding 10 years should be authorized by the School Land Board (SLB), the governing body of three members that currently consists of the land commissioner and two appointees of the governor. The subcommittee also recommended increasing the number of members on the SLB to five, with the lieutenant governor and speaker of the House participating in the appointment process. Under the subcommittee's recommendations, all groundwater sale or lease proposals would be subject to competitive bidding, except when a proposal was with a political subdivision of the state or an end user of the water or for a supply of water less than 125,000 gallons per day.

The Senate subcommittee also recommended that the SLB adopt specific rules for leasing land for groundwater development. These rules would require that regional water planning groups and local groundwater districts receive notification when the SLB was approached with a groundwater proposal and that buyers or lessees of PSF land comply with rules and permitting requirements set forth by the state and by local groundwater districts. Municipal and other proposals from political subdivisions would have to include in their applications such data as the amount of

water needed, water quality requirements, an estimated delivery price, and a commitment to abide by state and local regulations.

The subcommittee also recommended the prohibition of out-of-state groundwater exports from state lands. Further, any exports from state lands should be included as updates to regional and state water plans, according to the subcommittee. Another significant recommendation of the report is its proposal to repeal Water Code, sec. 11.3271,

Effects of groundwater use

One of the most serious geologic and environmental consequences stemming from excessive groundwater use has manifested itself in Harris and Galveston counties in Southeast Texas. Communities in this region have experienced substantial land subsidence due to groundwater withdrawals from the aquifers under their lands.

Subsidence occurs when the surface elevation of the land overlying an aquifer sinks as the aquifer is pumped excessively. As water is pumped out from under the land, air-filled spaces accumulate in soil that formerly was saturated. These air-filled spaces can collapse, causing a recession of the surface above that can lead to a host of problems, including an increased susceptibility to flooding, a serious concern along the hurricane-prone Gulf Coast.

After subsidence was documented in Southeast Texas, the 64th Legislature in 1975 created the Harris-Galveston Coastal Subsidence District. The district was charged with ending subsidence, which the district accomplishes by regulating the amount of groundwater that may be withdrawn from aquifers and transferring groundwater demand within the district to surface water supplies.

Additional environmental effects resulting from groundwater use include:

- **Drawdown.** Drawdown occurs as the water table decreases when water is pumped from an aquifer. As long as rainfall recharges the aquifer

at a rate equal to or greater than the rate at which water is withdrawn, drawdown will be temporary and unproblematic.

- **Overdrafting.** Overdrafting occurs when water is withdrawn faster than it is recharged. This can have numerous consequences. First, overdrafting caused by high volume pumps can cause well interference, leading to decreased capacity for those with smaller pumps tapping into the same aquifer. In addition, because surface water and groundwater are intertwined through the hydrologic process, overdrafting of artesian aquifers can cause a reduction of streamflows fed by an aquifer's springs. Saltwater intrusion also can be a problem for many overdrafted aquifers, particularly aquifers near the sea and deeper inland aquifers.
- **Mining.** Mining is the process of overdrafting an aquifer over a long period of time. The eventual result of mining an aquifer is gradual reduction in an aquifer's volume of water. Extraction becomes increasingly difficult and costly. Currently, the Ogallala aquifer, the largest aquifer in North America, which covers parts of West Texas, is a mined aquifer due to its low level of recharge.

These consequences of groundwater use are among the issues that many groundwater districts attempt to mitigate through well-spacing guidelines, pumping limits, and other regulations.

which grants the authority of the Rio Grande watermaster to use the Rio Grande as a means to transport groundwater from upstream lands to downstream users. This method of distribution has been proposed as a conduit for water transportation in the Rio Nuevo and other groundwater export proposals, but some have expressed concern that water in the Rio Grande could be lost through evaporation or other circumstances.

Bills considered by the 79th Legislature. In 2005, the 79th Legislature considered several bills during its regular session addressing the issues raised by the Senate interim committee reports. Bills containing the most sweeping groundwater policy changes were not enacted, although proposals contained in the failed legislation may serve as a starting point if a future Legislature addresses groundwater regulation reform.

The most significant changes proposed during the session appeared in SB 3 by Armbrister, which died on the House calendar on May 25. As passed by the Senate, SB 3 included several provisions relating to conjunctive management, which refers to a more integrated approach to management of groundwater and surface water resources. The Senate-passed version of the bill would have:

- provided remedies for interference with a domestic or agricultural well;
- required registration and reporting of water transactions;
- established training requirements for groundwater conservation districts; and
- established a groundwater management area council to coordinate the activities of groundwater conservation districts.

Supporters of the Senate-passed version of SB 3 said that these reforms were necessary to address the shortcomings of the rule of capture and to protect groundwater owners whose wells are affected by neighbors who over-pump. Supporters also said that the bill would provide some uniformity and coordination among groundwater districts across the state, ensuring that districts have the training and resources to adequately safeguard that state's groundwater resources. Opponents said that through the erosion of local control, the bill would have moved Texas away from a regulatory system in which local groundwater districts are the focus of groundwater management in the state.

The House committee substitute to SB 3 removed most of the provisions related to groundwater that were included in the Senate-passed version. Instead, the House substitute would have focused primarily on the creation of a process to preserve environmental flows for surface water and various provisions to promote water conservation in the state. The House substitute did retain some provisions dealing with groundwater, including a provision that would have prohibited a groundwater district from discriminating between owners of land that was irrigated for production and owners whose land was participating in a federal conservation program. The House substitute also would have established a 14-member committee to study and issue recommendations on the management of groundwater beneath state-owned lands.

SB 352 by Madla as passed by the Senate would have placed restrictions on the transfer of groundwater from state-owned land. Among its provisions, the bill would have:

- prohibited export to a foreign country of groundwater drawn from state-owned land;
- required the SLB to adopt rules governing the sale of groundwater from public school land; and
- mandated that leases allowing for the production of groundwater from the permanent university fund land be awarded through a competitive bidding process.

SB 352 died in the House Land and Resource Management Committee. Several of the bill's provisions were included in SB 1451 by Averitt, which also died in House committee.

Supporters of SB 352 said that the bill would provide necessary oversight and improve the transparency of agreements involving the sale of groundwater from state-owned lands. Opponents said that the new requirements could undermine the ability of the state to profit from these potentially lucrative projects in the future.

One bill dealing with groundwater policy that was enacted was HB 1763 by R. Cook, which instituted several changes that affect the planning and management of groundwater districts in the state. The bill requires each district to base its groundwater management plan on desired future groundwater conditions established through joint planning with other districts in its water management area. It mandates that districts issue permits up to the point that the total volume of groundwater permitted equals

managed available groundwater. The bill defines managed available groundwater as the amount available to be permitted for beneficial use in accordance with the desired future groundwater conditions. HB 1763 adds the goals of recharge enhancement, rainwater harvesting, precipitation enhancement, and brush control to the list of strategies that groundwater districts must include in their management plans. Public posting, notice, and open meeting requirements for groundwater districts were revised, expanded, and standardized. The bill also establishes a mediation process if a groundwater district comes into conflict with TWDB during the planning process.

Recent developments

Interim charges. Although no major groundwater legislation was passed in the 79th Legislature, the issue of groundwater regulation promises to remain a priority of the Legislature in the near future. During the current interim, House and Senate committees are studying the issue, and additional recommendations are likely to be forthcoming. In particular, among his interim charges, the lieutenant governor charged the Senate Natural Resources Committee with studying “all issues related to ground and surface water law, policy and management,” including:

- the role of federal, state, regional and local governments in setting water policies;
- the impediments to implementing water management strategies recommended in the regional and state water plans;
- the role of groundwater conservation districts;
- conjunctive use of both ground and surface water resources;
- the rule of capture;
- historic use standards;
- water infrastructure and financing, including financing sources for new water resources;
- water rights, including environmental flows and junior water rights;
- the transition of water rights from agricultural to municipal and industrial uses;
- water conservation;
- drought preparedness; and
- water marketing.

GLO rules. In March 2006, the GLO adopted administrative rules governing negotiations and transactions for groundwater development on PSF lands. The rules govern various aspects of groundwater transactions, including the development of groundwater resources on state lands and leasing procedures. Among their provisions, these rules governing groundwater leasing from state lands require that no project export groundwater to a foreign country. Any project to develop groundwater resources on PSF lands will be subject to all applicable federal, state, and local law, including rules of groundwater conservation districts in which the lands are located. Resources only may be developed when it is determined that the project will produce a sustained yield and will not adversely affect current uses of water from the same source.

Under the GLO rules, PSF lands may be leased through either a sealed bid procedure or direct negotiation, at the determination of the land commissioner. At the request of the land commissioner, the School Land Board will review proposed leases to determine whether the proposal meets certain goals, including:

- how well the project would take into account the public good, water conservation efforts, and economic growth;
- whether the project would adhere to applicable laws and groundwater conservation district regulations;
- whether the project would generate an acceptable rate of return; and
- whether water from the project could be treated and transported economically.

– by Tedd Holladay

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